



COMDTINST M9000.8

1 JUL 1991

COMMANDANT INSTRUCTION M9000.8

Subj: Polar Icebreaker Reliability Improvement Project
Management Plan

1. PURPOSE. The purpose of this Project Management Plan (PMP) is to define the organizational framework by which the Polar Icebreaker Reliability Improvement Project (RIP) is managed. This instruction serves as a guidance and reference document for planning, programming and management personnel involved in the RIP as well as those personnel requiring information about the RIP.
2. DISCUSSION. This PMP formalizes applicable management techniques currently in place which specifically apply to the Polar Icebreaker RIP project ensuring performance within schedules and budgets. It identifies the organizational elements within the Coast Guard responsible for accomplishing specific RIP tasks within the scheduled time frame. Addressed are the Project Manager's (PM's) and Project Officer's (PO's) authority, tasking, scheduling, reporting and support documents. As with any major project the most critical elements of success are a dedication to the project coupled with free, open, and prompt exchange of information.
3. PROCEDURES.
 - a. Headquarters division chiefs, support and facility managers, MLCPAC and the PM and PO assigned responsibilities by this PMP shall take it as both guidance and tasking. In addition to the regular reports required by this PMP, task leaders assigned under Headquarters division chiefs and support and facility managers shall immediately inform the PM whenever a situation arises which may affect the project scope, cost, schedule, or specific task commitment.

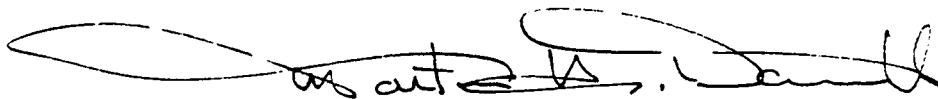
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3. b. The PM shall manage the project as outlined in this PMP.
The PM shall be the primary source of project information.
4. ACTION. Area and district commanders, commanders of maintenance and logistics command, unit commanding officers, chiefs of offices, and special staff divisions at Headquarters shall ensure compliance with this plan.

A handwritten signature in black ink, appearing to read "as attested by M. H. Daniell". The signature is fluid and cursive, with a large loop at the beginning and a long horizontal stroke extending to the right.

MARTIN H. DANIELL
Vice Admiral, U.S. Coast Guard
Acting Commandant

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CHAPTER 1. SCOPE AND OBJECTIVES

A. PROJECT SCOPE:

1. The POLAR Class Icebreaker Reliability Improvement Project (RIP) is intended to increase reliability and decrease maintenance and out of service time of mission essential equipment and systems. RIP will correct items identified as high in maintenance cost and manhours and low in supportability.
2. This project was initiated in FY-89 for the Polar Class Icebreakers to correct design deficiencies which impact reliability and maintainability and renew equipment nearing the end of its service life. The project is intended to halt the rapid escalation of maintenance hours, costs required to ensure the cutters meet their operational commitments and ensure the ships remain reliable through the end of their designed service life of thirty years. With only two polar icebreakers in service, reliability is essential to the safe and successful completion of their schedules.
3. The RIP work items are discussed in enclosures (1) through (4). No RIP work will be scheduled for completion beyond September 1999.
4. The project scope is limited to the items listed in enclosure (2). These items were identified by the Machinery Evaluation Board (MEB) on the POLAR SEA in 1986 and further defined during a meeting with Commandant (G-NIO) and (G-ENE), MLCPAC and PACAREA in April 1990.
 - a. Design: The design will be established by contract design specifications developed by Commandant (G-ENE) using input from Commandant (G-NIO), MLCPAC and PACAREA.
 - (1) G-ENE will develop contract design package (specifications and drawings) describing items/systems to be removed/modified and equipment to be procured and reinstalled in their place for each of the items listed in enclosure (2) less the CPP System Upgrade. MLCPAC shall perform all CPP work and refine each of the other design packages into a specification suitable for a commercial contract.

- (a) Where brand names are known to meet the requirements, up to three known brand names will be identified in the LLTM development information provided by G-ENE.
 - (b) Existing general arrangement drawings and system diagrams will be crosshatched by Commandant (G-ENE) to indicate removals and to show new system configurations. No detailed system arrangement drawings will be provided. Commandant (G-ENE) will ship-check diagrammatics in affected areas only. Shipboard personnel will not be tasked to assist in these checks although their assistance will be welcomed on a voluntary basis.
 - (c) Contract design specifications provided by Commandant (G-ENE) shall conform to MLCPAC's standard availability contract format. Standard specifications covering standard work items, such as temporary services, contractor performance, routine welding procedures, etc., will be supplied by MLCPAC. Specific requirements considered to be nonstandard, such as special welding procedures, special alignment procedures, test procedures, etc., will be provided by Commandant (G-ENE).
 - (d) MLCPAC will review all contract design specifications provided by Commandant (G-ENE) for technical content and submit comments in writing. Commandant (G-ENE) will incorporate comments into the design specifications as appropriate. He/She will review and approve the CPP design by MLCPAC. Once finalized, the design specifications establish the scope, design and technical content of the work items.
- b. Execution: Final contract design specifications provided by Commandant (G-ENE) shall be used by MLCPAC to develop final procurement specifications for GFE and LLTM and detailed design and installation specifications for contract packages.

- (1) GFE and LLTM contract procurement packages will be prepared for solicitation by the Project Officer and his/her technical/contracting support staff with Commandant (G-ENE) assistance as requested.
- (2) Detailed design specifications may be developed by MLCPAC or commercial firms at the Project Officer's discretion.

B. OBJECTIVES: Project objectives are divided into three categories; cost, schedule, and performance.

1. COST: Project costs for prime contract(s), contract modifications, Government Furnished Equipment (GFE), Long Lead Time Material (LLTM), initial spares, project administration, contract escalation and associated contract costs shall not exceed funding provided for executing the RIP.
2. SCHEDULE:
 - a. The RIP is married to an ambitious and aggressive operational schedule. The work will be accomplished during scheduled availabilities. The priority of RIP has been set by Commandant (G-NIO) as being subordinate to scheduled operations and maintenance to support scheduled operations performed by the unit, Naval Engineering Support Unit (NESU), Seattle, and Maintenance and Logistics Command, Pacific (MLCPAC). It is also subordinate to the Polar Science Upgrade (PSU) and the Machinery Control Alarm and Monitoring System (MCAMS) projects. The Project Manager (PM), Commandant (G-ENE), along with the Project Officer, MLCPAC(v), cannot permit any activities in the RIP which would adversely impact any of the higher priority activities. RIP work must not exceed allotted time frames in order to avoid negative impact on mission preparation and deployments.
 - b. The RIP Master Schedule is at enclosure (5).
 - c. Although the work opportunity windows are fixed, the amount of RIP work accomplished in each of these periods will be dependent upon emergent and higher priority maintenance and repair projects.

- d. Final determination of any changes in RIP regarding when work items will be accomplished, will be made by the PM after coordination with Commandant (G-NIO).
3. PERFORMANCE: The RIP will be accomplished using commercial contracts for GFE, LLTM, installation and (at the PO's discretion) detailed design. The contracts will be issued and administered by MLCPAC. Commandant (G-ENE) will establish the scope and design (less CPP) through contract design specifications and MLCPAC will execute contracts to accomplish the work.

CHAPTER 2. PROJECT MANAGEMENT ORGANIZATION

A. ORGANIZATION:

1. This project represents a complex acquisition requiring special organizational relationships. The matrix organizational interrelations described in this plan supplements the organizational relationships set forth in the Coast Guard Organization Manual, COMDTINST M5400.7.
2. Enclosure (6) depicts the RIP project management organization. Enclosure (7) identifies the AC&I billets provided for the RIP.

B. RESPONSIBILITIES AND AUTHORITY:

1. Program Manager: The Program Manager, Commandant (G-NIO), is responsible for setting program policy, mission requirements and operational requirements. The Program Manager will coordinate these requirements with the Operational Commander, PACAREA (Po), as necessary and appropriate.
2. Project Manager (PM): The PM, Commandant (G-ENE), is responsible for the project scope, RIP design, resource requests (funding and billets), funding management, project status reporting as required by DOT administrative procedures, cutter configuration control, and project policy management.
 - a. Cutter configuration control will be maintained through the contract design specifications developed by Commandant (G-ENE). Task configuration control will be maintained through the detailed design and installation specifications and is the responsibility of the PO.
 - b. Policy management includes any significant changes to the contract design specifications. Minor changes to the contract design specifications resulting from interpretation or clarification require only the Project Officer's approval. The PM must approve all changes that:
 - (1) Alter function, reliability, supportability, configuration, or system capability or operability.

- (2) May impact Coast Guard operating or engineering philosophy including vessel, machinery and personnel safety, and watch standing or manning policies.
 - (3) Affect maintenance support and training.
 - (4) Affect project costs or schedule, with the following exceptions: The PO may approve changes less than \$50,000 and may make schedule changes which do not result in an item being deferred to a different availability.
 - (5) Any other changes which fall under the general description of policy management.
 - c. The PM will be the final arbitrator of all unresolved conflicts within the scope of the RIP Project Management Plan. The PM shall work to resolve conflicts at the lowest level possible using effective communications and coordination.
 - d. The Project Manager shall maintain the RIP Financial plan and prepare Resource Change Proposals.
3. Project Officer (PO): The PO, MLC PAC(v), is responsible for the RIP planning, coordination, execution, monitoring and status reporting. He shall be assisted by functional staffs. This responsibility requires cooperation, communication and commitment of all parties involved to assure the project proceeds effectively.
- a. The Project Officer is the focal point of the RIP organization. The PO shall be accountable for the timely execution of the RIP within scope and budget. The PO is responsible for meeting the schedule in enclosure (5) within the constraints of the higher priority projects and operations identified in Chapter 1.
 - b. The Project Officer is directly accountable for:
 - (1) Preparation and maintenance of project item plans.
 - (2) Contract strategy including coordinating the interaction between RIP tasks and planned maintenance work.

- (3) Preparation and execution of LLTM and GFM, detailed design development and installation contracts.
 - (4) Contract change approval (within item scope).
 - (5) Scheduling required efforts for RIP tasks. The PO is authorized to task functional elements with accomplishing specific tasks within agreed upon cost, time, and performance constraints. MLCPAC(v) shall assist the PO in obtaining task commitments from other commands.
 - (a) Task Leaders shall be assigned for each task.
 - (b) The PO shall have direct access to RIP Task Leaders concerning all RIP related work originating within the functional staffs.
 - (6) Logistics support planning for the RIP, including development of the Integrated and Operational Logistics Support Plans.
 - (7) Maintenance of up-to-date project documentation and drawing files.
- c. RIP item configuration control is the responsibility of the PO. Cutter configuration management will be the responsibility of the PM.
 - d. The PO will coordinate functional specific issues with the appropriate functional staff to ensure that established Coast Guard policies are followed.
 - e. The PO is responsible for updating the project Obligation Plan and preparing budgetary documents for the PM as required.
 - f. The PO monitors and reports project progress to higher authority and works to resolve conflicts and other problems arising during execution of the RIP.

- g. The PO is authorized to request and receive summaries of project information including but not limited to task progress reports, financial status, cost accounting and budgetary information. All request for changes in project scope and financial plans will be reviewed by the PO before forwarding to the Project Manager. Changes in scope and financial plans will be approved by the Project Manager who will coordinate these changes with the Program Manager.
- 4. Task Leaders: MLCPAC, Reserve Training Center Yorktown, Supply Center Curtis Bay, Commandant (G-ELM), Commandant (G-ENE), Commandant (G-NIO) and others performing tasks under the RIP shall designate Task Leaders as key members of the project team to accomplish task commitments. The task leaders represent the interface between the functional staffs and the project staff. They coordinate the accomplishment of assigned project work and communicate task performance and problem identification to both their supervisors and the PO. Headquarters division chiefs and other commands (e.g. Reserve Training Center Yorktown and SCCB) shall apply adequate resources to accomplish project tasks within time, cost, and performance constraints as directed by the PO.
- 5. Technical and Support Staff: A technical and support staff shall be assigned to the PO to provide support and advice. The staff shall follow established Coast Guard Policy in carrying out their duties. A listing of RIP staff billets is at enclosure (7).

CHAPTER 3. PROJECT MANAGEMENT

A. COST ACCOUNTING AND BUDGET

1. Project Manager: The PM shall maintain the master project files and is responsible for managing the project's Financial Plan and providing resources to the PO.
 - a. The PM shall prepare and maintain the financial plan at enclosure (8).
 - b. The PM is responsible for initiating Resource Change Proposals (RCPs). Submission for RCPs shall be timely and in support of the project.
 - c. The PM shall maintain complete, up-to-date management documentation. This documentation shall be sufficient detail to provide a clear audit trail of the RIP. This includes such documentation as the Project Management Plan, RIP Master Schedule and the Financial Plan. In order to maintain the RIP Financial Plan, the PO must provide timely and complete obligation plans and information.
2. Project Officer: The PO shall take all action necessary to ensure all acquisitions are completed in accordance with approved scope, work task statements, project directives and tasks specified in this Project Management Plan and the contract design specifications.
 - a. The PO shall maintain the RIP Obligation Plan. The Obligation Plan will include the planned obligation estimates for the current and following four quarters and is a consolidation of the planned obligation levels approved for each point account. A copy of the RIP Obligation Plan will be furnished the PM.

B. SCHEDULING

1. Project Manager: The PM shall maintain control of the RIP Master Schedule at enclosure (5).
 - a. The RIP Master Schedule shall remain consistent with the Program Manager's and Operational Commander's prepared Employment Schedule.

- b. The RIP project must not conflict with the operating schedule, nor other scheduled activities of higher priority. The PM shall advise the Program Manager and Operational Commander of the impact to the RIP of all proposed and actual changes to the employment schedule. To the maximum extent possible, the Program Manager and Operational Commander shall consult with the RIP PM before making any schedule changes and must fully consider the possible impacts.
 - c. A quarterly scheduling conference will be held by the PO.
- 2. Project Officer: The PO is responsible for developing detailed schedules to accomplish the RIP and coordinating the work of all commands providing input to the RIP.
 - a. Interdependent tasks must be coordinated to provide the final product when required. The PO shall utilize task scheduling/management appropriate to the complexity of each defined task in order to identify conflicts with higher priority work and maintenance and identify tasks on the critical path interrelationships between tasks.
 - b. The PO must take necessary action to ensure that the RIP work does not exceed allotted time frames, nor interfere with mission preparation and deployments.

C. TASK MANAGEMENT:

- 1. Centralized management of the RIP will be the responsibility of the Project Officer. The planning process, contract strategy, estimates and scheduling of completion of each RIP task will be based on task information provided to the PO by the various Task Leaders. Where adequate Coast Guard resources do not exist or performance can not be attained in a timely manner using the CG matrix organization, the PO shall pursue other means of task accomplishment such as contracting for outside services. Critical resource shortages which can not be resolved at the MLCPAC level shall be resolved by the PM.
- 2. Technical Review Boards will be scheduled periodically by the PM to fully consider and validate the technical approaches to each RIP item.

CHAPTER 4. MONITORING, CONTROL, AND REPORTING

A. MONITORING

1. Project Manager: The PM shall monitor the RIP to insure its timely completion within budget. The PM shall insure time and resource budgets and project scope are maintained. This will be accomplished by trips to MLCPAC, contractor's facilities and the cutters, project and task status reports, contract progress reports, E-mail, telcons, and other communications with the Program Manager and PO.
2. Project Officer: The PO is responsible for monitoring the accomplishment of the RIP.
 - a. The PO shall prepare and maintain detail project and task schedules using appropriate management techniques and tools.
 - b. The PO shall maintain complete, up-to-date management documentation for the project. This will be accomplished by project and task status reports, contract progress reports, E-mail, telcons, and other communications with activities involved with the RIP.
3. Task Leaders: The task leaders shall provide the PO copies of all correspondence and documentation related to or affecting the RIP and all contract status reports. All correspondence and documentation shall be detailed to provide a clear audit trail.

B. CONTROL

1. The Project Manager controls the project through the project's financial plan, scope, design and master schedule.
 - a. The RIP Master Schedule, enclosure (5), establishes the overall schedule for the RIP and shall be maintained with input from Commandant (G-NIO) and MLCPAC.
 - b. The RIP Financial Plan is controlled by the appropriation of funds by Congress.
 - c. The scope is limited to those items of enclosure (2). No growth in items is permitted.

- d. The design is controlled by the policies of the Commandant.
- 2. The Project Officer controls the RIP's execution through the detailed schedule, detailed design and installation contracts, and the RIP Obligation Plan.
 - a. The detailed schedule shall identify all tasks required to accomplish the project objectives and their completion schedule. The PO will immediately notify the Project Manager and Task Leaders if the status of any task changes.
 - b. The detailed design and installation contracts will be controlled by the contract design specifications, the master schedule, project financial and obligation plans, and appropriate Federal regulations.
 - c. The Obligation Plan is controlled by the project's financial plan and schedule.
 - d. The PO will prepare and execute recovery plans which will be approved by the PM if cost, schedule, or performance goals are affected.

C. REPORTING

- 1. Each RIP project item has a cost (funds and asset utilization), a schedule (time constraint), and scope. Project reporting will be accomplished by information flow which reflects these three components projected as a whole. As a minimum, reports shall answer three questions:
 - a. To what degree has the scope of the project item been completed? This includes progress of the task work package and associated milestones.
 - b. How does actual progress towards completion date or cost of the project item compare to the planned progress or cost for that period?
 - c. Has the forecast scope, scheduled completion date, or cost of the task changed since the last report?
- 2. Required Reports: The following are the required reports for the RIP.

- a. Project Status Report. The PO shall submit the Project Status Report on a quarterly basis to the PM. This report shall be in the format of enclosure (9) and shall be submitted at a time designated by the PM.
 - b. Task Status Reports. Task leaders, through their Headquarters division chiefs or Commanding Officers', shall make a monthly status reports to the PO as of the end of the month for each assigned RIP project item. The report shall be received by the PO by the 5th day of the following month. The critical elements of the RIP Task Status Report are provided as enclosure (10).
3. Additional Reports: Other reports are required on an as needed basis to keep appropriate organizations and project personnel informed of the project's status.
 - a. OST Reports: The PM will make all required reports to the Office of the Secretary of Transportation as directed by the Commandant.
 - b. Congressional Reports: The PM will make all reports to Congress as directed by the Commandant.
 - c. Situation Reports: A situation report must be made to the PO by any task leader or other project management personnel immediately when any action occurs which may impact the scope, schedule, or cost of any RIP project item. The Project Officer shall keep the Project Manager informed of any impact on project cost, performance, scope or schedule.
4. Reports are not the only documentation required for the proper maintenance of the project files. Project status documentation includes all of the above reports plus updates to the Master and Detailed Schedules, financial and obligation plans, ILSP and OLSP. These plans and schedules will be updated at least annually.

CHAPTER 5. LOGISTICS SUPPORT REQUIREMENTS

- A. PURPOSE: Logistics support is required to insure that equipment and systems installed or modified by the RIP are maintained and supported for the remainder of the ship's life. Inadequate logistics planning and support will result in the goals of the RIP not being achieved.
- B. ORGANIZATION:
1. Integrated Logistic Support Manager (ILSM): An ILSM for RIP shall be appointed by and report to the Project Officer. Because of the magnitude of the RIP, the ILSM shall be a primary duty, not a collateral duty. The ILSM is responsible for the following items:
 - a. Developing the Integrated Logistics Support Plan (ILSP). The ILSM shall be guided by Commandant Instruction 4105.2, Acquisition and Management of Integrated Logistic Support (ILS) for Coast Guard Systems and Equipment, for developing the ILSP.
 - b. Incorporating Logistics Support Analysis (LSA) requirements into contracts.
 - c. Coordinating efforts of Commandant, MLCPAC and ICP's to accomplish requirements of the ILSP.
 - d. Converting the ILSP to an Operational Logistics Support Plan (OLSP) at the end of the RIP.
 2. Integrated Logistics Support Management Team (ILSMT): An ILSMT shall be formed by the Project Officer to assist the ILSM in developing the ILSP and accomplishing its requirements. The ILSMT shall be headed by the LSM and report to the Project Officer.
- C. REQUIREMENTS:
1. The definitive logistics guide for logistics for this project is COMDTINST 4105.2.
 2. Logistic Support Analysis (LSA): All equipment, whether Government or contractor procured, shall incorporate LSA when needed as a part of the contract. Cost will be considered when determining whether LSA should be considered. Commandant (G-ELM) will provide assistance to the LSM for developing LSA requirements for equipment purchases.

3. ILSP: A ILSP shall be developed and implemented to insure the project's goals are met and that logistics requirements are consistent with current Coast Guard policies. The ILSP shall be forwarded to Commandant (G-ELM) via the PM for approval prior to completion of the first installed RIP project item. Certain aspects of the ILSP should be developed early to guide system development. The following items must be considered when developing the ILSP:
- a. Supply Support: Supply support is comprised of several items.
 - (1) Allowances: This includes the timely provisioning, distribution, and inventory replenishment of spares, repair parts, and special supplies. Determine shipboard, intermediate facility and depot level allowances.
 - (2) Repairables Management: Determine who will manage intermediate and depot level spares and requirements for their management.
 - (3) Unit Supply Support: Identify sources for replenishment of unit allowances and supplies.
 - b. Maintenance Support: Maintenance support includes:
 - (1) Equipment Categories: Separate equipment into recognized categories and develop maintenance support guides for it.
 - (2) Maintenance Types: Identify the types of maintenance expected and develop required updates to the ship's Preventive Maintenance System publications.
 - (3) Maintenance Levels: Determine various levels of maintenance support required.
 - c. Training Support: Identify all maintenance and support training required as a result of the RIP. This shall include:
 - (1) Formal Training: Identify formal training requirements.
 - (2) Master Training List: Updates required for the Master Training List.

- (3) Training Equipment: Identify new training equipment required as a result of the RIP.
- d. Support and Test Equipment: Insure the required test and calibration equipment is available to the operating personnel and support maintenance activities.
 - e. Manpower and Personnel: Review cutter and NESU Seattle billet structure to insure adequate resources are available to properly maintain the RIP installed equipments.
 - f. Technical Data: Identify technical pub and drawing requirements to provide documentation necessary for maintenance and operation of the RIP installed/modified equipment and systems. Provisioning Technical Data (PTD) shall be provided with all equipment purchased.
 - g. Design Interface: Determine requirements for LSA for equipment and systems.
 - h. Configuration Management: Identify the system for tracking configuration changes before, during and after installation. Changes as a result of the RIP must be controlled and thoroughly documented for the benefit of future operators and maintenance personnel.

RELIABILITY IMPROVEMENT PROJECT WORK ITEMS

1. SCOPE: The Reliability Improvement Project's work items are based on the Machinery Evaluation Board of 1986 and the RIP conference held in April 1990. Enclosure (2) is a prioritized list of all RIP items.
2. OBJECTIVES: The goal of the RIP is to improve the reliability of the cutter's mission essential equipment to enable the ships to successfully complete all missions assigned.
3. PLANNING: RIP task items have been prioritized and phased to match the availability of maintenance time in the ships operational schedules. Enclosure (3) identifies the phasing of RIP task items. RIP task item phasing is not necessarily fixed to any one phase. Items are prioritized within each phase. The RIP task items must be accomplished in a way that concurrent maintenance availability work items so not conflict and suffer schedule and budget overruns. Enclosure (4) is the scope definition of each RIP task item.
4. EXECUTION: The execution of the RIP task items in availabilities is the responsibility of the Project Officer, who will ensure that project planning, resources and scope of work do not jeopardize operational mission schedules and inflate budget and funding constraints.

PRIORITIZED LIST OF RIP TASK ITEMS

1. CPP System Upgrade
2. Sewage System Modifications
3. Distilling Plant Renewal
4. Oily Water Separator Renewal
5. HVAC System Upgrade
6. Structural Repairs Resulting from Future SSMEB
7. Sea Water Cooling System Modifications
8. Heeling System Upgrade
9. Central Hydraulic System Modifications
10. L/O Purifier Upgrade
11. Bilge Dewatering/Ballast System Upgrades
12. MDE Upgrades
13. S/S Generator Upgrades
14. F/O Purifier Upgrade
15. Compressed Air System Upgrade
16. S/S Boiler Modifications
17. Gas Turbine Logistics Support
18. Helo Hangar Door Modifications
19. Installation of Standard Boat/Standard Davit System

PHASING OF RIP ITEMS

PHASE I:

1. Sewage System Modifications (Below Main Deck)
2. Distilling Plant Renewal
3. Oily Water Separator Renewal
4. L/O Purifier Upgrade
5. Bilge Dewatering/Ballast System Upgrades
6. F/O Purifier Upgrade
7. Compressed Air System Upgrade
8. S/S Boiler Modifications
9. Gas Turbine Logistics Support
10. Helo Hangar Door Modifications

Phase II:

1. CPP System Upgrade
2. Heeling System Upgrade
3. Central Hydraulic System Modifications
4. Installation of Standard Boat/Standard Davit System

Phase III:

1. HVAC System Upgrade
2. Sewage System Modifications (Main Deck and Above)
3. Structural Upgrades Resulting from Future SSMEB
4. Sea Water Cooling System Modifications
5. MDE Upgrades
6. S/S Generator Upgrades

NOTE: Items are prioritized within phases, but the phases do not necessarily reflect overall RIP item priorities. Assignment of items to phases was determined by overall priority, design lead times, completion of prerequisite items, and distribution of affected areas.

RIP TASK ITEMS SCOPE DEFINITION
Phase I

1. SEWAGE SYSTEM - Improve reliability/serviceability of the ship's sewage system.

- Modify system configuration to better segregate gray water and black water drain lines.

- Modify the sewage system serving the 2nd deck heads by splitting the sewage system serving the main deck and above. Provide a vacuum flush system for the 2nd deck heads. When preparing contract specifications for providing a 2nd deck vacuum flush system, size that vacuum flush system to accommodate the later incorporation of the sewage system serving the main deck and above. Thus, completely changing the existing sewage system on the Polar class to a Vacuum Flush System.

- Install new turbid drain tanks and pumps below the first platform level.

- Relocate gray water tanks to lower level.

2. DISTILLING PLANT - Replace the two existing 8000 GPD two stage flash evaporators with two 9600 GPD vapor compression type units similar to those manufactured by MECO. The new units will be provided complete with supporting equipment (pumps and exchangers) accessible and not located underneath the evaporator shell.

- Repipe distillate dump valve so dump is overboard.

- Install an automatic feedwater treatment system and a chemical cleaning system.

3. OILY WATER SEPARATOR - Replace existing units with those more tolerant of ship's vibration and bilge contaminants.

- Replace both existing OWS units with two non-cartridge type OWS units (Sigma model sl-7.5T-32 gpm or equal). These units will be required to separate all types of diesel fuel and lube oils used on board the Polar Class cutters; in addition, the new OWS units will also be required to separate various non-biodegradable cleaning chemicals presently used in the machinery spaces by the ships force.

4. LUBE OIL PURIFICATION CAPABILITY - Renew lube oil purifiers in diesel 1, diesel 2, and MTR/GR Room.

- Replace each existing 250 GPH lube oil purifier with a new self-cleaning purifier providing 290 GPH (ALFA-LAVAL model WHPX 405 or equal). Provide a smaller (retaining the same BTU rating) but more efficient electric heat exchanger (ALFA-LAVAL HEATPAC heat exchanger or equal) and a small intermediate sludge tank for each purifier.

- Install intermediate sludge tank with small sludge transfer pumps to prevent oil from purifiers entering into the bilges. Sludge will be transferred to ships dirty oil tank.

PHASE I (Continued)

5. BILGE DEWATERING/BALLAST SYSTEM - Install 3" air operated pumps (AOP) (Sandpiper model SB3-A or equal) in each of the following locations:

<u>LOCATION</u>	<u>QTY</u>	<u>CAPACITY</u>	<u>AIR CONSUMPTION</u>
MTR Room	01	210 GPM	200 SCFM (replaces 2" AOP)
GTB Room	01	210 GPM	200 SCFM (replaces centrifugal pump)
Diesel 1	01	210 GPM	200 SCFM (replaces centrifugal pump)
Diesel 2	01	210 GPM	200 SCFM

- Add eductors and associated piping to Diesel 1, Diesel 2, MTR Room and Turbine Room in such a way that the eductors can take suction from either the bilge and deballast suction main or directly from the bilge space in which the eductor is located. The discharge from each eductor will be individually piped overboard. Firemain pressure piping (actuating line) will be provided to each eductor with cutout valves and remote mechanical linkage to the second deck.

6. F/O PURIFICATION CAPABILITY - Renew existing 35 gpm and 125 gpm F/O purifiers located in the GT room with 2 identical 72 gpm self-cleaning purifiers (ALFA-LAVAL model WHPX-413 or equal) with heaters.

7. COMPRESSED AIR SYSTEM - Analyze post Science Upgrade and post RIP configuration cutter to assess compressed air system load requirements.

- Upgrade the existing system to support all ship's service requirements.

- Install two new rotary screw type compressors (LeRoi model WE75SS or equal), approximately 330 CFM at 125 psi each. This compressor will have a water cooled after cooler and oil cooler which will be cooled by a branch connection from the existing sanitary system.

- The design/operation of the new compressors will not allow the retention of the existing S/S air flasks in the same location.

8. S/S BOILER - Design and install automatic regulated boiler feed water de-aeration and chemical injection system.

- Evaluate boiler fire control system and update/replace if necessary.

- Develop overhaul specification; disassemble/inspect and replace S/S boiler tubes as required using MLCPACs past overhaul specifications.

- Install cross connect system for boiler feed pumps.

PHASE I (Continued)

- Repipe condensate tank vent with new vent condenser and modify tank vent arrangement to prevent condensate dripping to bilge.

9. GAS TURBINE ENGINE SPARE PARTS - Review Machinery Evaluation Board on FT4A supportability. Dependent on MEB's recommendations, revise Gas Turbine APL's and procure spares.

10. ACCESS DOOR, HELICOPTER HANGAR - Replace hanger door chain drive assembly with a new drive shaft system.

- Replace existing door deck mounted dogging arrangement with dogging mechanisms that are welded to the retaining bracket on the bottom of the door; similar to the rotatable cam type dogging mechanism on the 270' WMECs.

- Replace existing lip seal with an 1/8" thick canvas lined compressible seal. This type of seal has proved dependable on the 270' WMECs.

PHASE II

1. CPP SYSTEM - Upgrade hydraulic system, install supportable equipment including pumps.

- Install two additional hydraulic lube oil purifiers so each shaft may operate on its own purifier. Provide piping to be cross connected between shafts and purifiers with directional (safety lock) valves.

- Install the "R" system with new pumps. Escher-Wyss to design "R" system and supply OD boxes.

- Procure third spare (clockwise) propeller and shaft to complete spare ship set, overhaul existing propellers, develop Shoreside Allowance List (SAL) of propeller overhaul parts, and buy parts to stock and maintain at NESU Seattle.

- Evaluate the improvement in blade seal, resulting from installation of an open loop system and additional purifiers.

- Evaluate standardizing shaft diameters.

- Research historical maintenance data, develop standard using MLCPAC's maintenance procedures, ensure new (spare) propeller is built to this new base line.

- Replace the shaft coupling tapered belts with straight hydraulic bolts and plan for and stock 20% spares at the NESU level.

2. HEELING SYSTEM - Modify system to facilitate in-place repair without major disassembly.

3. CENTRAL HYDRAULIC SYSTEM - Analyze system for solution to leakage problems and modify accordingly.

4. BOAT HANDLING DAVIT SYSTEM - Renew existing davits with a new standard designed davit system being developed by G-ENE.

- New design will provide better control when launching and recovering the MSB.

- New design will be evaluated with the central hydraulic system to ensure compatibility.

PHASE III

1. HVAC SYSTEM - Perform HVAC load analysis of post Science Upgrades and post RIP configuration cutter.

- Design to meet Naval Engineering design standards. The system should be modified to be capable of maintaining habitability requirements from -60 deg. F to +95 deg. F including wind chill and humidity factors. Consideration of a "core" scheme whereby certain areas of the ship would be habitable during a "wintering over" is to be evaluated.

- Upgrade chill water system to ensure design standards.

- Redesign (Engine) machinery space intake ventilation to take air from a source that will not adversely effect the machinery space ambient air temperature.

2. SEWAGE SYSTEM - Improve reliability/serviceability of the ship's sewage system.

- Modify system configuration to better segregate gray water and black water drain lines.

- Modify the sewage system serving the main deck and above. Provide a vacuum flush system for the main deck and above heads. This will completely changing the existing sewage system on the Polar class to a Vacuum Flush System.

- Install new turbid drain tanks and pumps.

- Relocate gray water tanks if required.

3. Structural Repairs - Solve erosion/corrosion problem in stern tubes.

4. SEA CHESTS - Redesign sea chest systems to alleviate problems with ice and snow ingestion that cause salt water pumps to become air bound.

- Provide a system with better valve control which allow 100% return to seachest

- Install/rearrange seachests for selected equipment that will allow the deicing capabilities of that equipment to be maintained inside the seachest.

5. MAIN PROPULSION DIESEL ENGINE HEADS - Install upgraded heads, pistons and camshafts on each MDE per ALCO upgrade instructions.

- Research what ALCO presently has for 251 Plus package.

- Install new Navy certified fuel coalescer filter system on all main and S/S diesel engines.

6. SHIP SERVICE GENERATOR/ENGINE - Perform load analysis of post Science Upgrades and post RIP configuration.

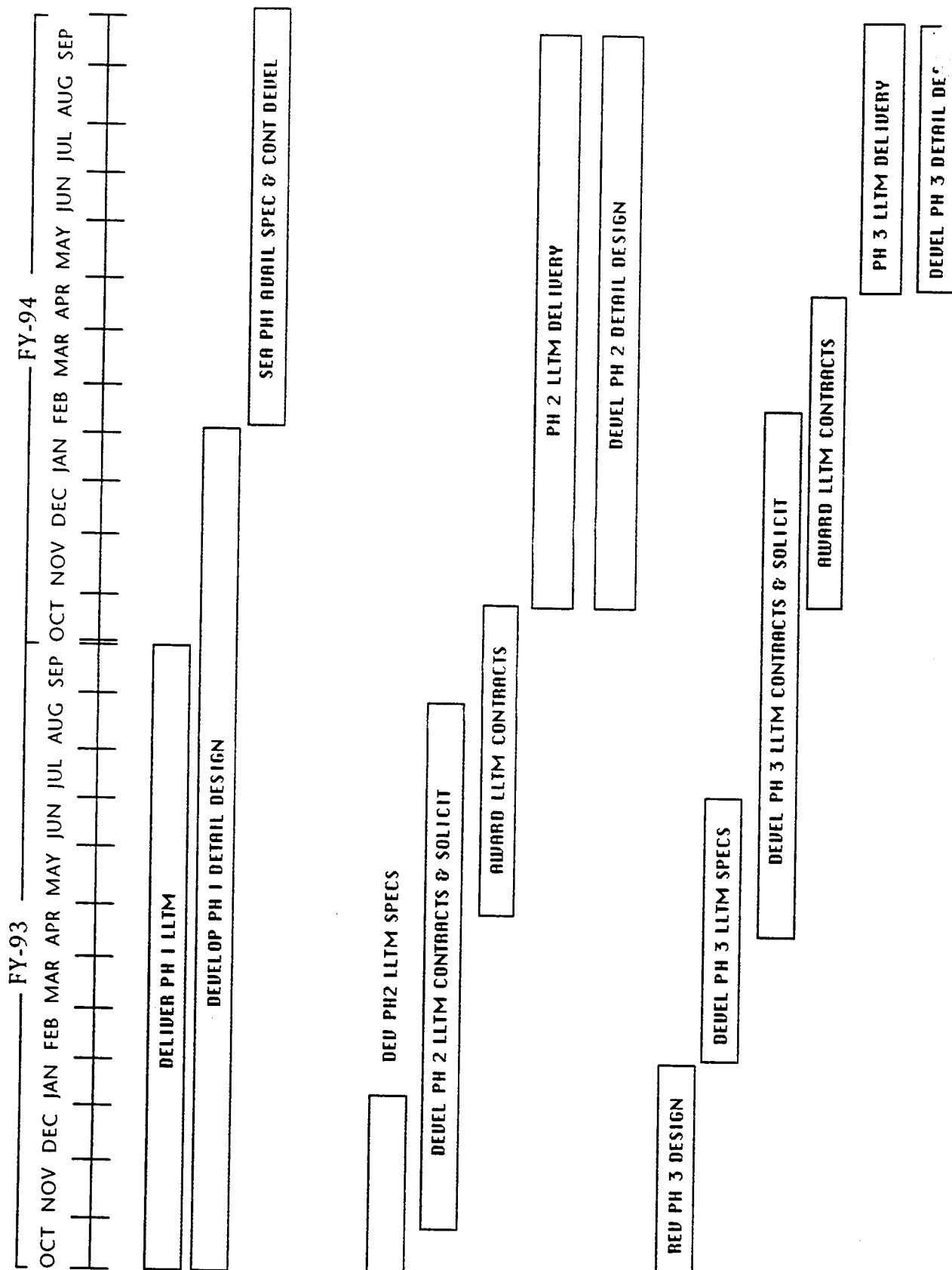
- Evaluate transformer burnout problems and recommend fix.

PHASE III (Continued)

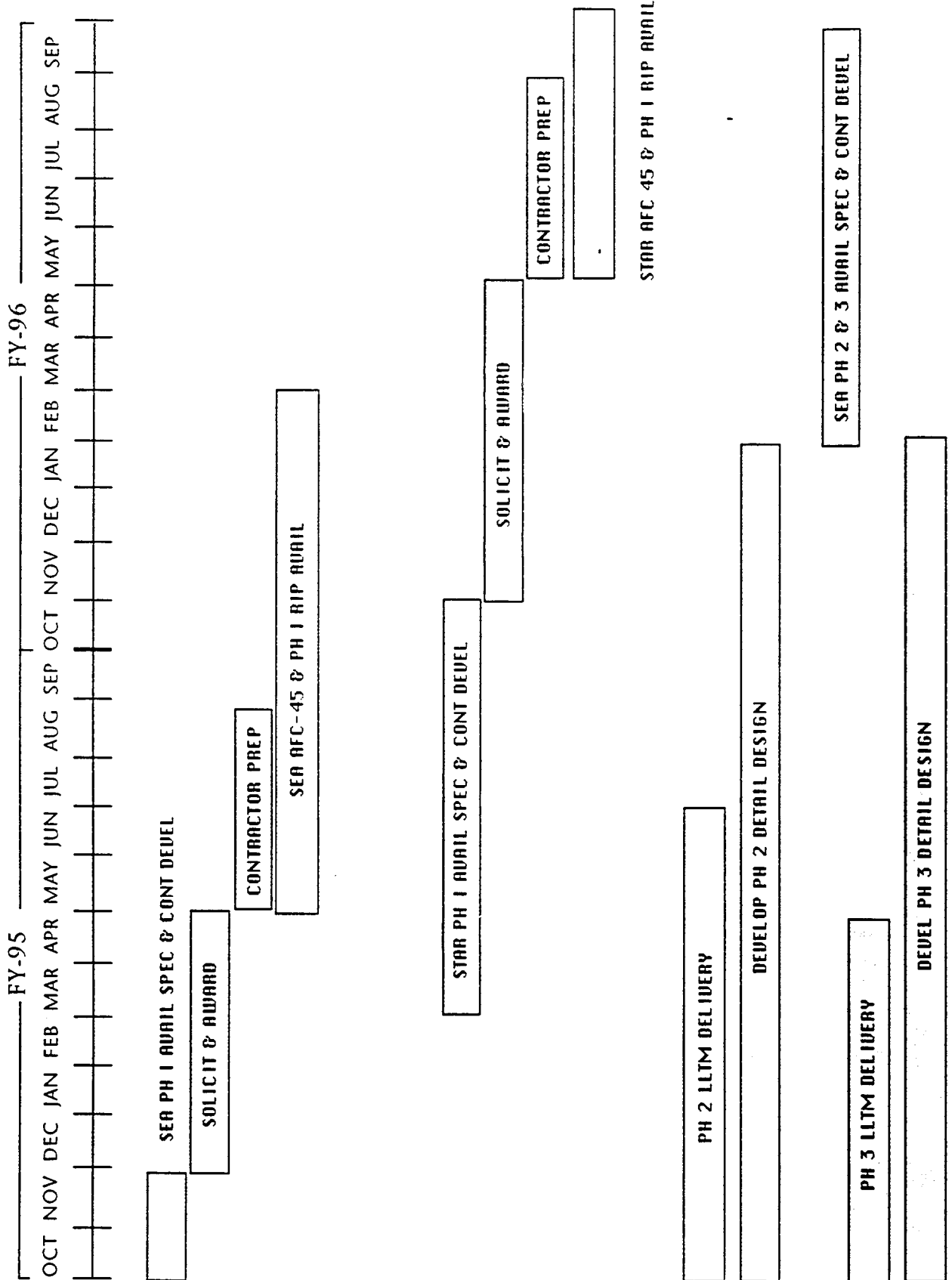
- Evaluate supportability/repair spares required to improve supportability/reliability.
- Upgrade ship service and generator sets to increase generator capacity if cost effective.

PH 3 CONTRACT DESIGN

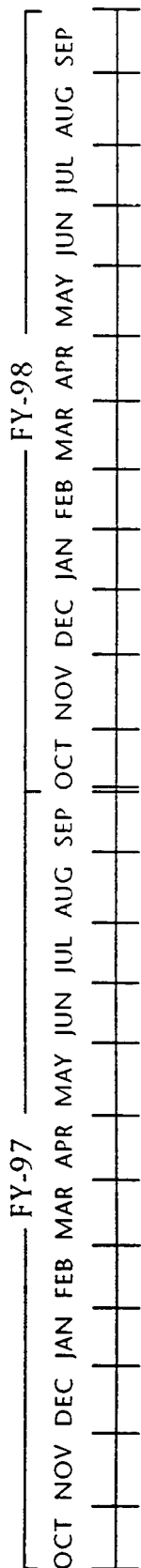
RIP MASTER SCHEDULE



RIP MASTER SCHEDULE



RIP MASTER SCHEDULE



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STAR AFC 45 & PH1 RIP AVAIL

SEA PH 2 & 3 SOLICIT & AWARD

CONTRACTOR PREP

SEA AFC 45 & PH 2 & 3 RIP AVAIL

STAR PH 2 & 3 AVAIL SPEC & CONT DEVEL

SOLICIT & AWARD

CONTRACTOR PREP

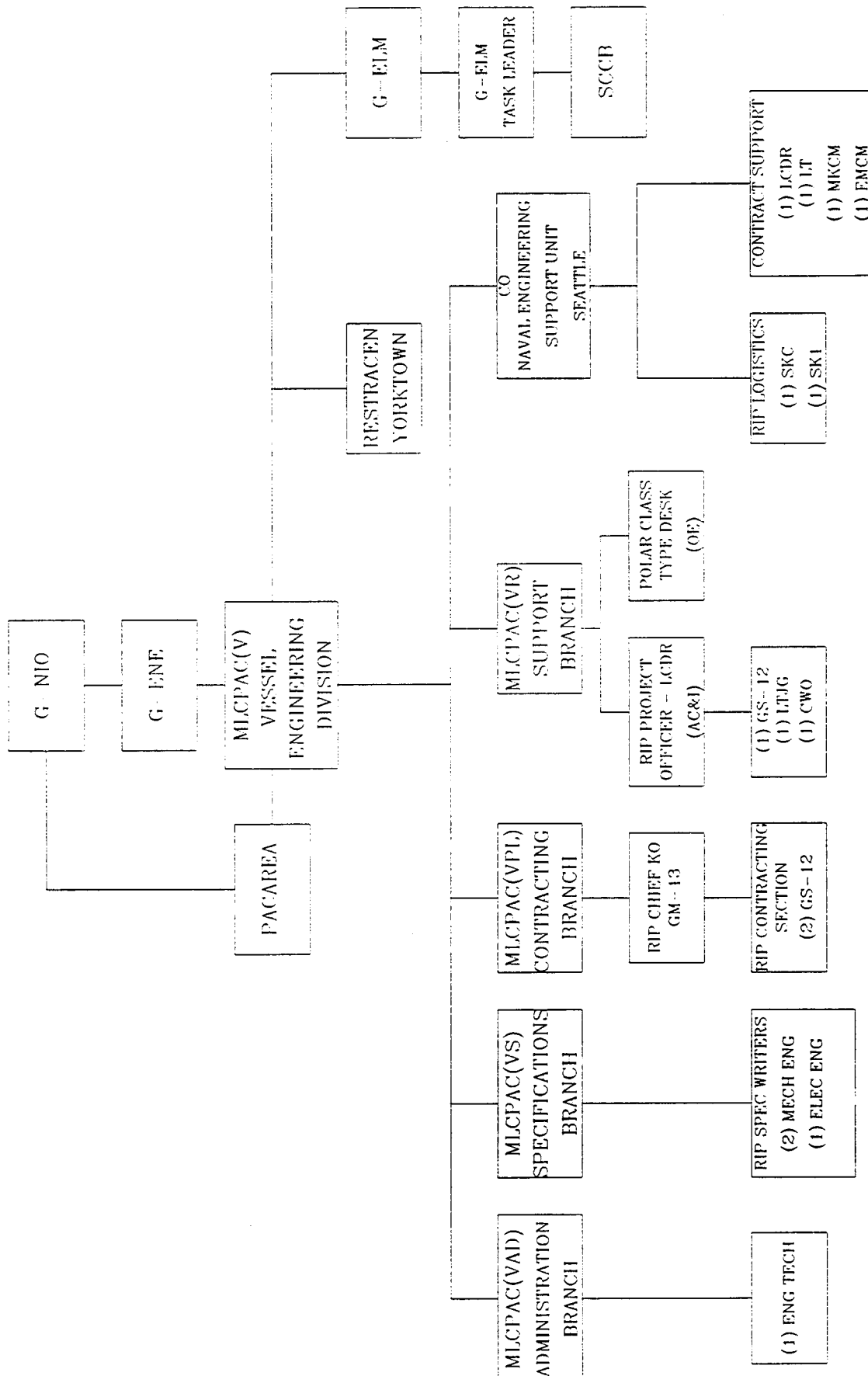
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STAR AFC 45 & PH 2 & 3 RIP AVAIL

RIP MASTER SCHEDULE

FY-99											
OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP

STAR REC 45 & PH 2 & 3 RIP AVAIL



RIP AC&I BILLETS

<u>RANK</u>	<u>OBC</u>	<u>FUNCTION</u>	<u>LOCATION</u>
LCDR	52084G	Dep Project Manager	Commandant (G-ENE)
LCDR	52784L	Dep Project Officer	MLCPAC
LT	34783B	ILS Manager	MLCPAC
CWO	52783G	GFE Coordinator	MLCPAC
GS-12		Specification Manager	MLCPAC
GM-13		Contracting Officer	MLCPAC
GS-12		Mechanical Engineer	MLCPAC
GS-12		Mech/Elec Engineer	MLCPAC
GS-12		Contract Specialist	MLCPAC
GS-12		Contract Specialist	MLCPAC
GS-12		Mechanical Engineer	MLCPAC
GS-11		Draftsman	MLCPAC
LCDR	52484A	Contract Coordinator	NESU Seattle
LT	52483A	MP Section	NESU Seattle
EMCM		Electrical Section	NESU Seattle
MKCM		MP Section	NESU Seattle
SKC		Logistics Section	NESU Seattle
SK1		Logistics Section	NESU Seattle

FINANCIAL PLAN

1. OBJECTIVES - The objectives of the POLAR Class Reliability Improvement Project (RIP) Financial Plan are to ensure that:

A. Adequate financial resources are obtained when required to accomplish the RIP.

B. Funds are budgeted and obligated on time and as authorized.

C. Funding carryover is minimized.

D. An audit trail and historical record are maintained.

E. Adequate project resources are provided.

F. Reporting requirements are accomplished.

2. PLANNING:

A. Funds for the RIP are requested through Resource Change Proposals and appropriated by Congress.

B. The PM will maintain the RIP Financial Plan.

C. The PO will maintain the RIP Project Obligation Plan. The Obligation Plan will include the planned obligation estimates for the current and following four quarters and is a consolidation of the planned obligation levels approved for each point account. The RIP Obligation Plan will include the following cost categories as a minimum:

(1) Prime Contract

- a. Basic contract for detailed design
- b. Approved modifications to basic contract
- c. Economic price adjustments (escalation)
- d. GFE costs
- e. Basic contract installation costs

(2) Related Costs

- a. Contract Administration (Project Office, Travel)

FINANCIAL PLAN
(Continued)

- b. Outfit and spares
- c. Logistics support costs
- d. Personnel support costs
- e. Other costs (Training, etc.)

3. EXECUTION:

A. Project funds will be transferred to Commander, MLC PAC for execution in accordance with the Financial Plan.

B. The PO shall initiate fund requests to the Project Manager via MLC PAC if funding shortfalls become apparent.

C. The PO shall keep a detailed record of all expenditures of the project funds.

D. The PO will provide MLC PAC such reports as required concerning financial and obligation planning and expenditures.

4. ESTIMATE: RIP cost estimates by items are attached. The annual totals represent the annual RCP requests for project AC&I funds.

RIP COST ESTIMATES

RIP TASK ITEM	FY-90	FY-91	FY-92	FY-93	FY-94	FY-95	FY-96	FY-97	FY-98	SUBTOTAL	TOTAL
1. CPP SYSTEM	0	600	0	10502	2000	5500	3981	0	0	22583	22583
DESIGN	0	600	0	187	0	0	0	0	0	787	
LLTM	0	0	0	10315	0	0	0	0	0	10315	
PRODUCTION	0	0	0	0	2000	5500	3981	0	0	11481	
2. S/S GEN UPGRADE	0	0	0	0	890	0	0	1365	1573	3828	3828
DESIGN	0	0	0	0	40	0	0	0	0	40	
LLTM	0	0	0	0	850	0	0	0	0	850	
PRODUCTION	0	0	0	0	0	0	0	1365	1573	2938	
3. DISTILLING PLANT	0	0	2005	0	200	210	0	0	0	2415	2415
DESIGN	0	0	100	0	0	0	0	0	0	100	
LLTM	0	0	1905	0	0	0	0	0	0	1905	
PRODUCTION	0	0	0	0	200	210	0	0	0	410	
4. HVAC UPGRADES	0	0	0	0	335	0	0	684	790	1809	1809
DESIGN	0	0	0	0	85	0	0	0	0	85	
LLTM	0	0	0	0	250	0	0	0	0	250	
PRODUCTION	0	0	0	0	0	0	0	684	790	1474	
5. CHS MODS	111	65	0	330	0	525	605	0	0	1636	1636
DESIGN	111	65	0	110	0	0	0	0	0	286	
LLTM	0	0	0	220	0	0	0	0	0	220	
PRODUCTION	0	0	0	0	0	525	605	0	0	1130	
6. SEA CHEST MODS	0	0	0	0	270	0	0	1908	2263	4441	4441
DESIGN	0	0	0	0	270	0	0	0	0	270	
LLTM	0	0	0	0	0	0	0	0	0	0	
PRODUCTION	0	0	0	0	0	0	0	1908	2263	4171	
7. BILGE SYS MODS	0	0	275	0	250	268	0	0	0	793	793
DESIGN	0	0	75	0	0	0	0	0	0	75	
LLTM	0	0	200	0	0	0	0	0	0	200	
PRODUCTION	0	0	0	0	250	268	0	0	0	518	
8. OWS RENEWAL	0	0	495	0	296	310	0	0	0	1101	1101
DESIGN	0	0	75	0	0	0	0	0	0	75	
LLTM	0	0	420	0	0	0	0	0	0	420	
PRODUCTION	0	0	0	0	296	310	0	0	0	606	
ANNUAL SUBTOTALS	111	665	2775	10832	4241	6813	4586	3957	4626	38606	38606

RIP COST ESTIMATES

RIP TASK ITEM	FY-90	FY-91	FY-92	FY-93	FY-94	FY-95	FY-96	FY-97	FY-97	SUBTOTAL	TOTAL
9. HELD HANGER DOOR	0	0	50	0	148	155	0	0	0	353	353
DESIGN	0	0	50	0	0	0	0	0	0	50	
LLTM	0	0	0	0	0	0	0	0	0	0	
PRODUCTION	0	0	0	0	148	155	0	0	0	303	
10. COMPRESS AIR	0	0	310	0	250	275	0	0	0	835	835
DESIGN	0	0	75	0	0	0	0	0	0	75	
LLTM	0	0	235	0	0	0	0	0	0	235	
PRODUCTION	0	0	0	0	250	275	0	0	0	525	
11. SEWAGE SYSTEM	0	0	650	0	1095	610	0	420	420	3195	3195
DESIGN	0	0	150	0	100	0	0	0	0	250	
LLTM	0	0	500	0	200	0	0	0	0	700	
PRODUCTION	0	0	0	0	795	610	0	420	420	2245	
12. S/S BOILER MODS	0	0	130	0	160	168	0	0	0	458	458
DESIGN	0	0	50	0	0	0	0	0	0	50	
LLTM	0	0	80	0	0	0	0	0	0	80	
PRODUCTION	0	0	0	0	160	168	0	0	0	328	
13. MDE UPGRADES	0	95	0	0	725	0	0	1110	1210	3140	3140
DESIGN	0	95	0	0	0	0	0	0	0	95	
LLTM	0	0	0	0	725	0	0	0	0	725	
PRODUCTION	0	0	0	0	0	0	0	1110	1210	2320	
14. MGT SPARES	0	0	0	500	525	551	0	0	0	1576	1576
DESIGN	0	0	0	0	0	0	0	0	0	0	
LLTM	0	0	0	500	525	551	0	0	0	1576	
PRODUCTION	0	0	0	0	0	0	0	0	0	0	
15. HEELING SYS MOD	0	50	0	985	0	738	847	0	0	2620	2620
DESIGN	0	50	0	160	0	0	0	0	0	210	
LLTM	0	0	0	825	0	0	0	0	0	825	
PRODUCTION	0	0	0	0	0	738	847	0	0	1585	
16. BOAT DAVITS	0	0	0	946	0	64	74	0	0	1084	1084
DESIGN	0	0	0	66	0	0	0	0	0	66	
LLTM	0	0	0	880	0	0	0	0	0	880	
PRODUCTION	0	0	0	0	0	64	74	0	0	138	
ANNUAL SUBTOTALS	0	145	1140	2431	2903	2561	921	1530	1630	13261	13261

RIP COST ESTIMATES

RIP TASK ITEM	FY-90	FY-91	FY-92	FY-93	FY-94	FY-95	FY-96	FY-97	FY-97	SURTOTAL	TOTAL
17. L/O PURIFIERS	0	0	0	638	0	402	460	0	0	1500	1500
DESIGN	0	0	0	110	0	0	0	0	0	110	
LLTM	0	0	0	528	0	0	0	0	0	528	
PRODUCTION	0	0	0	0	0	402	460	0	0	862	
18. F/O PURIFIERS	0	0	335	0	150	155	0	0	0	640	640
DESIGN	0	0	75	0	0	0	0	0	0	75	
LLTM	0	0	260	0	0	0	0	0	0	260	
PRODUCTION	0	0	0	0	150	155	0	0	0	305	
19. STRUCTURAL RPRS	0	0	0	0	0	0	0	0	0	0	0
DESIGN	0	0	0	0	0	0	0	0	0	0	
LLTM	0	0	0	0	0	0	0	0	0	0	
PRODUCTION	0	0	0	0	0	0	0	0	0	0	
20. BILLET START-UP	0	600	0	300	200	0	0	0	0	1100	1100
21. SSEE POLAR SEA	0	300	0	0	0	0	0	0	0	300	300
ANNUAL SUBTOTALS	0	900	335	938	350	557	460	0	0	3540	3540
ANNUAL TOTALS	111	1710	4250	14201	7494	9931	5967	5487	6256	55407	55407

DESIGN COSTS: 2699

LLTM COSTS: 19969

PRODUCTION COSTS: 31339

BILLET & SSEE 1400

=====

TOTAL: 55407

SOURCE: MULTIPLAN: RIFFUND

RELIABILITY IMPROVEMENT PROJECT STATUS REPORT

Reporting Period: _____ (Quarter/Year)

1. Summary of Project Activity/Accomplishments:

The purpose of this section is to provide feedback data on project activity/accomplishments. Provide DESCRIPTIVE feedback to the following:

- a. Percentage of Project completion
- b. Tasks completed since last report
- c. Problems resolved since the last report.

2. Summary of Project Shortcomings/Needs:

The purpose of this section is to provide feedback data on project shortcomings/needs. Provide the following as a minimum:

- a. Problem statement (i.e. state the problem)
- b. Analysis of the problem
- c. Why the problem exist
- d. Analysis of how the problem is being managed
- e. What happens to the problem if it is not fixed -
 - o in the short term
 - o in the long term
- f. Recommend solutions and impacts on the RIP

3. Next Planned Project Activity:

Provide a overview summary of what project tasks will be worked on and the expected accomplishments to those tasks before the next report. Include:

- a. Tasks expected to be completed before next report
- b. Major events upcoming before the next report (i.e., FAT's, major installations, contract awards, etc.)

MLCPAC(v) Signature

Encl: Provide copies of Tasks Status Reports and other project documentation.

RELIABILITY IMPROVEMENT PROJECT TASK STATUS REPORT

Project Task: _____ Reporting Period: _____
(Month/Year)

Organization Responsible: _____

1. Summary of Project Activity/Accomplishments:

The purpose of this section is to provide feedback data on project activity/accomplishments. At a minimum provide DESCRIPTIVE feedback to the following:

- a. Percentage of task completion
- b. Expected completion date of task
 - o short term milestones
 - o long term milestones
- c. Problems resolved since the last report.

2. Summary of Project Shortcomings/Needs:

The purpose of this section is to provide feedback data on project shortcomings/needs. At a minimum provide the following:

- a. Problem statement (i.e. state the problem)
- b. Analysis of the problem
- c. Why the problem exist
- d. Analysis of how the problem is being managed
- e. What happens to the problem if it is not fixed -
 - o in the short term
 - o in the long term
- f. Recommend solutions its impact

3. Next Planned Project Activity:

Provide a overview summary of what project tasks will be worked on and the expected accomplishments to those tasks before the next report.

- a. Tasks expected to be completed before next report
- b. Major events upcoming before the next report (i.e., FAT's, major installations, contract awards, etc.)

Task Leader Signature

Division Chief Signature

